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Quality Control Report For

Bituminous Concrete

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/004 Date:03.11.2017

RBI- Technical Services

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Sample Supplied by Client
Date of Testing	**02.11.2017**

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Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	384	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	78	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	304	
4	Aggregate Impact value = percent fines			
	100* (W_2/W_1) percent	20.47	20.83	
				20.65

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer.
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/004 Date:03.11.2017

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RBI- Technical Services

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Sample Supplied by Client
Date of Testing	**02.11.2017**

Total Weight of Sample: **5000** gms

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	502	10.04	10.04	89.96	79 - 100	
9.5	435	8.70	18.74	81.26	70 - 88	
4.75	852	17.04	35.78	64.22	53 - 71	
2.36	721	14.42	50.20	49.80	42 - 58	
1.18	503	10.06	60.26	39.74	34 - 48	
0.600	248	4.96	65.22	34.78	26 - 38	
0.300	505	10.10	75.32	24.68	18 - 28	
0.150	431	8.62	83.94	16.06	12 - 20	
0.075	375	7.50	91.44	8.56	4 - 10	

Total Weight of Sample: **5000** gms

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	551	11.02	11.02	88.98	79 - 100	
9.5	468	9.36	20.38	79.62	70 - 88	
4.75	753	15.06	35.44	64.56	53 - 71	
2.36	567	11.34	46.78	53.22	42 - 58	
1.18	425	8.50	55.28	44.72	34 - 48	
0.600	644	12.88	68.16	31.84	26 - 38	
0.300	465	9.30	77.46	22.54	18 - 28	
0.150	401	8.02	85.48	14.52	12 - 20	
0.075	495	9.90	95.38	4.62	4 - 10	

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
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RBI- Technical Services

Date:03.11.2017

Aggregate Shape Test
IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Sample Supplied by Client
Date of Testing	**02.11.2017**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	0	13.5	w_5	0	40.5	x_5	0
20	16	W_6	1240	10.8	w_6	119	32.4	x_6	125
16	12.5	W_7	1200	8.55	w_7	98	25.5	x_7	108
12.5	10	W_8	220	6.75	w_8	68	20.2	x_8	83
10	6.3	W_9	150	4.89	w_9	15	14.7	x_9	61

Flakiness Index 10.68%

Elongation Index 13.42%

Combined Flakiness & Elongation Index **24.09%**

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI -Technical Services
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RBI-TECHNICAL SERVICES
Proprietor

Assistant Engineer

Assistant Executive Engineer
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bengalore.

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RBI - Technical Services

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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/004 **Date: 03.11.2017**

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TEST REPORT

Client	:	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
Name of the work	:	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Source of Sample	:	Sample Supplied by Client
Date of Testing	:	02.11.2017

The results of the tests conducted on the **CRMB 55** sample using for Bituminous Concrete collected from the contractor's plant are as follows:

Sl.No	Description	Test Result	Requirement as per IS:15462:2004 for CRMB 55
1	Penetration at 25^0c, 1/10 mm,100g.5s	55	< 60
2	Softening point, ^{0}c	55	Min. 55
3	Flash Point, ^{0}c	235	Min. 220

⇒ *The results indicated above are based on the tests carried out on the samples received in the laboratory.*
⇒ *Any Query regarding the report must be reported immediately.*

RBI -Technical Services
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Proprietor

Assistant Engineer

Assistant Executive Engineer
Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/004 Date:06.11.2017

RBI- Technical Services

Specific Gravity And Water Absorption Test

IS: 2386 Part III

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Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Type of Mix	**Bituminous Concrete**
Source of Sample	Sample Supplied by Client
Date of Testing	**02.11.2017 to 05.11.2017**

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2460	2480	2470	
2	Weight of basket suspended in water	W_2 g	1215	1215	1215	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1245	1265	1255	
4	Weight of saturated surface dry aggregate in air	W_3 g	2005	2005	2004	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	760	740	749	
6	Weight of oven dried aggregate	W_4 g	1999	1995	1998	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.63	2.70	2.67	2.649
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.651	2.733	2.689	2.670
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.50%	0.30%	0.30%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
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Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

Proprietor

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Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

RBI-Technical Services
Project Management Consultancy Services
Temperature Record Log Sheet

Title of the Work:	Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.
Client:	Executive Engineer, Byatarayanapura Division, BBMP.
Agency:	Sri. G.N Ramesh
Mix Type:	BC
Date:	07/11/2017

Sl no	Tipper No.	Time	Cleaning of the Surface	Application of Tack coat	Mix Laying Temperature (C^0)	Mix Rolling Temperature (C^0)	Depth of the Mix Before Rolling(mm)	Depth of the Mix after Rolling(mm)	Remarks
1	KA.07.A.7980		✓	✓	135.5	107.8	53	40	
2	KA.51.B.8851		✓	✓	129	110	53	40	
3	KA.07.A 0207		✓	✓	128	112	53	40	
4	KA.57.5912		✓	✓	132	111	53	40	
5	KA.52.5553		✓	✓	134	112	53	40	
6	KA.52.1066		✓	✓	135	113	53	40	
7	*		*	*		*			*
8									
9									
10									
11									
12									
13									
14									
15									

RBI-Technical Services **Client Representative** **Contractor Representative**

For RBI - Technical Services

Site Engineer

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07 - 11 - 2017

Vehicle no: KA 07 A 7980

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.00	469.50
3. Difference in weight after extraction (W3) gms= (W1-W2)	30.00	30.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.10
5. Average in %	6.05	

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For RBI - Technical Services

Client Representative

Contractor Representative

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07-11-2012

Vehicle no: KA 51 B 8851

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	469.50	469.50
3. Difference in weight after extraction (W3) gms= (W1-W2)	30.50	30.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.10	6.10
5. Average in %	6.10	

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For RBI - Technical Services
Site Engineer

Client Representative

Contractor Representative

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07 - 11 - 2017

Vehicle no: KA 07 A 8027 7

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.00	470.00
3. Difference in weight after extraction (W3) gms= (W1-W2)	30.00	30.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.00	6.00
5. Average in %	6.00	

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For RBI - Technical Services

Site Engineer

Client Representative

Contractor Representative

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07- 11 - 2017

Vehicle no: KA 52 5912

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.50	470.00
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.50	30.00
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.9	6.00
5. Average in %	5.95	

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For RBI - Technical Services

Site Engineer

Client Representative

Contractor Representative

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07 - 11 - 2017

Vehicle no: KA 52 5553

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.50	470.50
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.50	29.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	5.90
5. Average in %	5.90	

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For RBI - Technical Services
Site Engineer

Client Representative

Contractor Representative

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	**Improvements to roads in Chiranjeevi layout church road in ward no.07, Byatarayanapura.**
AGENCY	Sri. G.N Ramesh
TYPE OF MIX	BC
DATE OF TESTING	07 - 11 - 2017

Vehicle no: KA 52 1066

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	469.50	469.50
3. Difference in weight after extraction (W3) gms= (W1-W2)	30.50	30.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.10	6.10
5. Average in %	6.10	

RBI-Technical Services
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For RBI - Technical Services
Site Engineer

Client Representative

Contractor Representative

RBI - Technical Services

Road - Building - Irrigation Material Testing Laboratory
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Quality Control Report
For the

Work of: 5)Improvements to Roads and Drains in Hoysala layout Amruthalli in ward no.07, Byatarayanapura.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

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Quality Control Report For

Wet Mix Macadam

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

RBI - Technical Services

Road - Building - Irrigation Material Testing Laboratory
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ISO 9001 - 2008 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/005

Date:10.10.2017

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RBI- Technical Services

AGGREGATE IMPACT VALUE

(IS : 2386 Part - 4)

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of Work	**Improvements to Roads and Drains in Hoysala layout Amruthalli in ward no.07, Byatarayanapura.**
Source of Sample	**Hot Mix Plant**
Date of Testing	**09.10.2017**
Location ID	**Ward no. 08 Roads**
Material	**Wet Mix Macadam**

Description		Trails		
		1	2	3
Wt.Of stone pieces(dry) passing IS Sieve 12.5mm but retained in IS Sieve 10mm(gm)	(Wa)	322.0	323.0	323.0
Wt.Of the fraction retained in IS Sieve 2.36mm after the impact test(gm)	(Wb)	263.2	263.4	263.9
Wt.Of the fraction Passed in IS Sieve 2.36mm after the impact test(gm)	(Wc)	58.60	58.80	58.40
Aggregate Impact value (%)	(Wc/Wa)100	18.2	18.2	18.1
Average Aggregate Impact value (%)			**18.2**	
Specified Aggregate Impact value (%)			**30.0**	

RBI -Technical Services (CONSULTANT)
RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer
AE(W9)

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/005 Date:10.10.2017

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RBI- Technical Services

GRADATION FOR WMM
MORTH TABLE-400-11

Name of the Work	**Improvements to Roads and Drains in Hoysala layout Amruthalli in ward no.07, Byatarayanapura.**
Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Source of Sample	**Hot Mix Plant**
Date of Testing	09.10.2017
Material	**WMM**

Oven dry Wt.(gms) **10000**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	420	4.2	4.2	95.80	95-100
22.4	3315	33.15	37.4	62.7	60-80
11.2	1645	16.45	53.8	46.2	40-60
4.75	1520	15.2	69.0	31.0	25-40
2.36	1030	10.3	79.3	20.7	15-30
0.600	845	8.45	87.8	12.3	8-22
0.075	745	7.45	95.2	4.8	0-8

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer
AE(Lab)

Assistant Executive Engineer
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd Stage, Bengaluru - 560 104.
Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

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Tel. : 080 - 23300857 Cell : 9448352709 Email : rbitc2@gmail.com Website : www.rbits.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/005

Date:10.03.2017

Aggregate Shape Test
IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to Roads and Drains in Hoysala layout Amruthalli in ward no.07, Byatarayanapura.
Type of Mix	**WMM**
Source of Sample	Hot Mix Plant
Date of Testing	**09.10.2017**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	2160	13.5	w_5	145	40.5	x_5	125
20	16	W_6	1750	10.8	w_6	150	32.4	x_6	115
16	12.5	W_7	850	8.55	w_7	120	25.5	x_7	100
12.5	10	W_8	750	6.75	w_8	120	20.2	x_8	95
10	6.3	W_9	150	4.89	w_9	15	14.7	x_9	5

Flakiness Index 9.72%
Elongation Index 7.77%
Combined Flakiness & Elongation Index 17.49%

Comments:
→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES
Proprietor

Assistant Engineer
AE(WM)

Assistant Executive Engineer
Assistant Executive Engineer.
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

RBI - Technical Services

Road - Building - Irrigation Material Testing Laboratory
NABL Accredited Laboratory as per ISO/IEC 17025-2005
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Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/005 Date: 12.10.2017

RBI- Technical Services

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-13

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

Client	:	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of Work	:	Improvements to Roads and Drains in Hoysala layout Amruthalli in ward no.07, Byatarayanapura.
Source of Sample	:	Hot Mix Plant
Date of Sample Testing	:	**09.10.2017 to 11.10.2017**
Material	:	**WMM**

Sl. No.	Name of Test	Test Method	Test Results
1	Liquid Limit	IS : 2720-1985 Part 5 RA : 2010	23.50%
3	Plasticity index	IS : 2720-1985 Part 5 RA : 2010	NP

Remarks:

1 Results relate only to the sample (s) under test in as received condition and applicable parameter (s).
2 The sample will be stored upto one month from the date of issue of test report unless otherwise specified.

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer
AE(WQ)

Assistant Executive Engineer
Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
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